



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,497	01/16/2004	Tatsuo Fukushi	59495US002	7691

32692 7590 01/31/2006

3M INNOVATIVE PROPERTIES COMPANY  
PO BOX 33427  
ST. PAUL, MN 55133-3427

EXAMINER

HU, HENRY S

ART UNIT

PAPER NUMBER

1713

DATE MAILED: 01/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/759,497	<b>Applicant(s)</b> FUKUSHI ET AL.	
	<b>Examiner</b> Henry S. Hu	<b>Art Unit</b> 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on After Final of January 12, 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1713

### DETAILED ACTION

1. This Office Action is in response to **Request for Reconsideration** (after final) filed on January 12, 2006. In view of the Applicants' key argument that "it is not proper to make final on a first office action in a continuing or substitute application where that application contains material which was presented in the earlier application after final rejection but was denied entry because new issues were raised that required further consideration and/or search", **the previous Final office action filed on November 23, 2005 is now withdrawn and then converted to non-final office action** with the fact that at least some amendment (a peroxide) is found on parent Claims 1, 15 and 18.

This Office Action is still in response to faxed Request for RCE along with Claim Amendment filed on September 28, 2005. In view of the RCE amendment, all three parent **Claims 1, 15 and 18** were further amended so as to specify the use of **a combination of a peroxide curable component** as component (b) and **a peroxide** compound as component (d). The minor typographical error on dependent **Claim 8** was also corrected. The support of the claim amendment regarding such **a combination from two components (b) and (d)** is from page 4 at line 27 to page 5 at line 16 in specification. **Claims 1-18 are now pending** with three independent claims (Claim 1, Claim 15 and Claim 18). An action follows.

***Response to Argument***

2. Applicant's argument filed on September 28, 2005 has been fully considered but they are not persuasive. The focal arguments related to the patentability will be addressed as follows: In view of the Applicants' argument on pages 7-11 of Remarks, both two 103(a) rejections over Paglia and Brinati, each individually in view of Araki are still sustained.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. The limitation of parent ***Claim 1*** of the present invention relates to a compound comprising: (a) ***an elastomeric copolymer*** having interpolymerized monomeric units derived

Art Unit: 1713

*from vinylidene fluoride monomer, at least one cure site moiety, and substantially no perfluorinated vinyl ether monomers; (b) a peroxide curable component; (c) at least one mineral filler, such that upon vulcanization the resulting compound has a retraction at lower temperature (TR-10) of -20°C or less, and (d) a peroxide.*

*Parent Claim 15 relates to Claim 1 using two specified monomers in component (a) and without the limitation of using mineral filler, while other parent Claim 18 relates to the process of forming a compound of Claim 1. See other limitations of dependent Claims 2-14 and 16-17.*

5. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paglia et al. (US 6,506,460) in view of Araki et al. (US 6,706,819 B1) for the reasons set forth in paragraphs **6-7 and 12** of office action dated 1-6-2005 and paragraphs **5-12** of office action dated 6-6-2005 as well as the discussion below.

6. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinati et al. (US 5,175,223 or its equivalent EP 445,839 A1) in view of Araki et al. (US 6,706,819 B1) for the reasons set forth in paragraphs **9-11** of office action dated 1-6-2005 and paragraphs **5-12** of office action dated 6-6-2005 as well as the discussion below.

7. **Applicants:** Applicants have now claimed in twice-amended parent **Claim 1** an unexpected way of obtaining a curable fluoroelastomeric composition comprising four major

Art Unit: 1713

components as: (a) an elastomeric copolymer of vinylidene fluoride, at least one cure site moiety, and substantially no perfluorinated vinyl ether monomers; (b) a peroxide curable component; (c) at least one mineral filler, and (d) a peroxide. Applicants further allege that upon vulcanization the resulting compound has a retraction at lower temperature (TR-10) of 20°C or less. Parent Claim 15 relates to Claim 1 but using **two specified monomers in component (a) and without the limitation of using mineral filler**; other parent Claim 18 is a process of forming the compound of Claim 1. It is noted that **peroxide as component (d) is now required** to be with component (b) in all three parent claims.

8. With respect to both two **103 rejections over Brinati/Araki and Paglia/Araki**, the Applicants furthermore allege that the secondary reference **Araki** does not teach or suggest two things as following: (A) how to improve low temperature properties such as TR10, and (B) using a specific copolymer having substantially no perfluorinated vinyl ether monomer or the copolymer being structurally different (see page 7 bottom as well as page 11 middle of Remarks). A linking motivation in both rejections is thereby lacking.

The Applicants finally allege that primary reference **Brinati** does not use any copolymer containing cure site monomer (see page 7 middle of Remarks). Therefore, the polymers of Brinati are not capable of peroxide curing (see unexpected benefits on the Table of page 10 in Remarks). The Applicants specifically argue that primary reference **Paglia only uses a UV curing system for rapid curing and thereby does not apply to peroxide curing** (even with a

Art Unit: 1713

desire) (see page 11 bottom of Remarks). A linking motivation in both rejections is thereby lacking.

9. **Examiner:** As suggested by the Examiner, parent **Claim 18** has been amended by the Applicants to be consistent with other parent Claims 1 and 15. In view of the fact that all three parent **Claims 1, 15 and 18** now require to use a combination from a peroxide curable component (b) and a peroxide compound (d), the patentability weight is certainly improved in view of the involved prior art but is still not enough for allowance as following reason:

10. With respect to the use of secondary reference **Araki**, the result “to improve low temperature properties such as TR 10” on the curing process would become **an issue of inherent properties** after a linking of the respective references. Regarding Araki may have used some polymers containing PMVE or PPVE (which is structurally away from the limitation of claimed copolymer), attention is directed to that Araki’s peroxide curing system is functional effectively with cure site monomer and/or diiodo group-containing compound (see page 6 top of the Final) even with the existence of perfluorinated vinyl ether monomers. Additionally, Araki has already used some other kinds of copolymer (see column 3, line 10-61) which are containing no perfluorinated vinyl ether monomer(s) at all.

11. As discussed earlier, both types of crosslinking reactions including **slow and rapid routes** have been disclosed or suggested by Paglia. For instance, various cure-site monomers including bromine, iodine, chlorine and nitrile as well as a diiodine compound such as 1,3-

Art Unit: 1713

diiodoperfluoropropane can be incorporated in the co-polymerization of fluorinated copolymers; such reactive cure sites in the copolymers will improve crosslinkability so as to obtain better mechanical properties. In a very close examination on Paglia's disclosure, a UV curing system at room temperature has been **preferably** applied. However, other system such as hemolytic or heterolytic heat-induced decomposition of peroxide compound may be still workable even Paglia may have found that it may cause some trouble.

12. With respect to the proper use of Brinati as primary reference for peroxide curing, Brinati in US and EP patents has indeed disclosed the preparation of various fluoroelastomers (containing **no perfluorinated vinyl ether monomer**) to carry a low Tg and **a low compression set at low temperature** (equivalent to TR 10). Therefore, Brinati is only silent about adding "a cure site moiety" in the course of copolymerization. However, as discussed above **Araki** has clearly taught that a diiodo group-containing compound such as 1,3-diiodoperfluoropropane or if necessary a cure-site monomer can be incorporated in the copolymerization of fluorinated copolymers so as to improve crosslinkability with better mechanical properties after cured.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a compound comprising (a) an elastomeric copolymer from vinylidene fluoride (VDF) and cure site monomer(s) but no perfluorinated vinyl ether, (b) **a peroxide curable component**; (c) at least one mineral filler, and (d) **a peroxide**:



Art Unit: 1713

**US Patent No. 6,191,208 B1 to Takahashi et al.** disclose a curable perfluoroelastomer composition comprising (A) a perfluoroelastomer having units of TFE, PAVE and a nitrile group-containing monomer, (B) a curing agent, and (C) anhydrous silica (abstract, line 1-7; column 1, line 50-62). The **nitrile group-containing monomers** are 8-CNVE or the like, which **are related to derivatives of perfluorinated vinyl ethers** (column 2, line 60 – column 3, line 25). **No VDF** is used in the copolymer at all. **PAVE is included in copolymer. No peroxide is used.** Therefore, Takahashi fails to teach or fairly suggest the limitation of present invention.

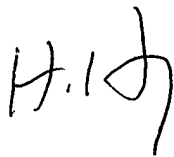
**US Patent No. 5,384,374 to Guerra et al.** disclose a curable perfluoroelastomer composition comprising (A) a perfluoroelastomer having units of VDF and HFP, (B) a fluorinated ether composition comprising a functional fluoroaliphatic mono- or polyether curing agent, and (C) some curatives and additives (abstract, line 1-4; column 3, line 27-57; column 5, line 3 – column 6, line 57). Although **peroxide compound may be included** in the curable composition (column 5, line 3-13; column 1, line 68; column 2, line 36-38), **no cure-site monomer** is used in making the copolymer at all. Therefore, Guerra fails to teach or fairly suggest the limitation of present invention.

14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

Art Unit: 1713

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'H. Hu' with a stylized flourish at the end.

Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

January 25, 2006